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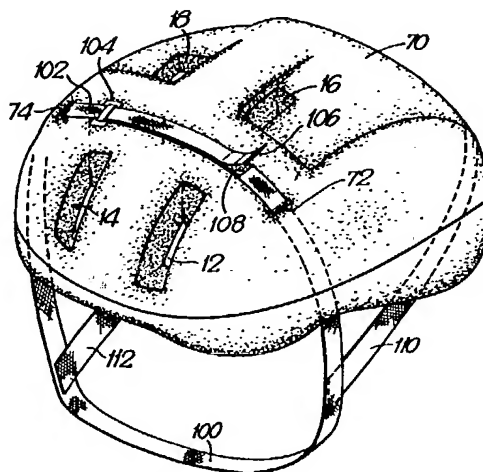
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(54) **Bicycle helmet.**

(57) A helmet comprising a helmet body (70), a chin strap (100) arranged in use to pass under a wearer's chin with each end of the strap passing between the rim of the helmet and the wearer's head and through slots (72, 74) in the helmet body (70) to the outer side thereof, and a releasable fastener (108) located outside the helmet body (70) and above the rim thereof, the adjustment means (108) engaging with the ends of the chin strap (100). The chin strap (100) is in one-piece strap without any form of connector under a wearer's chin. The releasable fastener (108) is operable to tighten the chin strap (100) when the latter is in position under a wearer's chin.

*Fig.5.*



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This invention relates to a helmet of the type comprising a helmet body, a chin strap arranged in use to pass under a wearer's chin with each end of the strap passing between the rim of the helmet and the wearer's head and through slots in the helmet body to the outer side thereof, and adjustment means located outside the helmet body and above the rim thereof, the adjustment means engaging with the ends of the chin strap. This type of helmet is particularly suitable for wear by cyclists.

US-A-4903348 discloses a helmet of this type. The ends of the chin strap protrude through openings in the top of the helmet where they are connected to strap adjusters. A buckle is provided at an intermediate point along the length of the chin strap to enable it to be separated into two parts, the buckle resting against the user's face when in use. In order to vary the length of the strap, it is necessary to lift each adjuster clear of the top of the helmet. Consequently, adjustments can be effected only when the strap is slack. When the length of the strap is correctly adjusted, the helmet can only be placed on or removed from a wearer's head when the buckle is unfastened.

The present invention is particularly, but not exclusively, concerned with the provision of a helmet for use by an infant or young child, for example, for use when riding on an auxiliary seat fitted to an adult bicycle. The skin on the cheeks and neck of an infant is relatively flaccid and consequently there is a danger of trapping a fold of the infant's skin when fastening the buckle of a chin strap. The present invention aims to provide a helmet which is not subject to this disadvantage.

According to the invention, in a helmet of the type described above, the chin strap is a one-piece strap and the adjustment means is operable to tighten the chin strap when the latter is in position under a wearer's chin.

Preferably, the adjustment means includes a releasable fastener located outside the helmet body.

In one form of the invention, the releasable fastener may be a two-part buckle, or alternatively it may be a touch-and-close fastener such as "VELCRO" (Registered Trade Mark).

One end of the chin strap may be connected to the other end thereof by the releasable fastener.

A respective cheek strap may be secured to the chin strap so as to extend in use rearwardly across each of the wearer's cheeks to a respective slot in a rear part of the helmet body. Each end of the chin strap may be connected to the free end of a respective cheek strap, by a respective releasable fastener. Alternatively, the free ends of the two cheek straps may be joined to one another by a second releasable fastener.

An embodiment of the invention will be now be described by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a front perspective view of a helmet in accordance with a first embodiment of the invention;

Figure 2 is a rear elevation of the helmet shown in Figure 1;

Figure 3 is a front perspective view of a helmet in accordance with a second embodiment of the invention;

Figure 4 is a rear elevation of the helmet shown in Figure 3; and

Figure 5 is a front perspective view of a helmet in accordance with a third embodiment of the invention.

Figures 1 and 2 show a bicycle helmet having a generally dome shaped body 10 formed from an energy-absorbing crushable plastics material such as expanded polystyrene. The body 10 has two front air vents 12 and 14, two top air vents 16 and 18 and two rear air vents 20 and 22.

Adjacent to each of the front vents 12 and 14 is a respective front strap slot 24, 26. A chin strap 28 has one end 30 projecting through the front strap slot 24 from the inside of the helmet-body 10. A ring 32, which is formed from metal or a rigid plastics material and is of flattened shape so as to have two straight parallel sides, is sewn on to the end 30 of the chin strap 28. The other end 34 of the chin strap 28 projects from the inside of the helmet out through the other front strap slot 26 and is sewn on to a similar ring 36. The length of the chin strap 28 is chosen to be such that, when the ring 32 abuts against the slot 24 and the ring 36 abuts against the slot 26, the strap 28 can be passed comfortably beyond the wearer's chin.

A first cheek strap 40 has one end sewn on to the chin strap 28 at a location 42 below the slot 24 so as to be positioned, in use, at a level between the wearer's upper and lower jaws. The other end of the cheek strap 40 projects from inside the back of the helmet through a rear strap slot 44 located below the vent 20 and then forwards over the top of the helmet and through the ring 32. The hook part of a touch-and-close fastener 46 is sewn on to the upwardly facing surface of the part of the chin strap 40 between the slot 44 and the ring 32 and the loop part of the touch-and-close fastener 46 is sewn on to the downwardly facing part of the portion 48 of the cheek strap 40 which projects through the ring 32.

A similar cheek strap 50 is sewn on to the chin strap 28 at a location 52 opposite a location 42. The cheek strap 50 extends through a second rear strap slot 54 in the rear of the helmet body 10 and through the ring 36 and its free end 58 is secured by a touch-and-close fastener similar to the touch-

and-close fastener 46.

After the helmet has been positioned on the head of a wearer with the strap 28 under the wearer's chin, the free ends 48 and 58 of the cheek straps 40 and 50 are pulled through the rings 32 and 34 until the chin strap 28 is retained securely under the wearer's chin and then secured in place by the respective touch-and-close fasteners.

Figures 3 and 4 illustrate a helmet having a body 70 which is similar to the body 10 of Figure 1, with vents 12, 14, 16, 18, 20 and 22. However, its front strap slots 72 and 74 and rear strap slots 76 and 78 are oriented approximately at right angles to the corresponding slots 24, 26, 44 and 54 of Figures 1 and 2.

The helmet shell 70 of Figures 3 and 4 is provided with a chin strap 76, the ends of which project upwardly through the slots 72 and 74 where they are connected respectively to the buckle part 78 and the tongue 80 of a two-part fastener by respective three-bar strap adjusters 82 and 84.

Two cheek straps 86 and 88 are sewn to the chin strap 76 and have their ends threaded through the slots 76 and 78 at the back of the helmet. The ends are then attached, by respective three-bar adjusters 90 and 92 to the tongue part 94 and the buckle part 96 of a two-part fastener. With this arrangement, the effective lengths of the straps 76, 86 and 88 can be adjusted while the helmet is being worn but it is not necessary to readjust their lengths on each occasion when the helmet is to be worn by the same user.

Figure 5 illustrates an alternative strap arrangement for the helmet shown in Figures 3 and 4. A chin strap 100 has its ends projecting upwardly through slots 72 and 74, the end 102 projecting through the slot 74 being sewn on to an elongate ring 104. The other end 106 is threaded through the ring 104 and has the two parts of a touch-and-close fastener 108 sewn on to confronting surfaces. The harness also has cheek straps 110 and 112 which project through the slots 76 and 78 (see Figure 4) at the back of the helmet shell 70. The ends of the cheek straps 110 and 112 may be interconnected by a touch-and-close fastener but the relatively short distance the slots 76 and 78 restricts the range of adjustment which can be obtained with such an arrangement. Consequently, it will usually be preferable to use a two-part fastener, similar to that illustrated in Figure 4, for interconnecting the ends of the cheek straps 110 and 112.

In all three embodiments of the invention, the chin strap may have a safety link between the points of attachment of the two cheek straps, arranged to yield when the load on the chin strap exceeds a predetermined threshold. This may be of any known type and guards against the risk of

imposing excessive forces on the wearer's neck in the event of the rim of the helmet catching on an obstruction during an accident.

## 5 Claims

1. A helmet comprising a helmet body (10, 70), a chin strap (28, 76, 100) arranged in use to pass under a wearer's chin with each end of the strap passing between the rim of the helmet and the wearer's head and through slots (24, 26; 72, 74) in the helmet body (10, 70) to the outer side thereof, and adjustment means (46, 78, 108) located outside the helmet body (10, 70) and above the rim thereof, the adjustment means (46, 78, 108) engaging with the ends of the chin strap (28, 76, 100), characterised in that the chin strap (28, 76, 100) is a one-piece strap and the adjustment means (46, 78, 108) is operable to tighten the chin strap (28, 76, 100) when the latter is in position under a wearer's chin.
2. A helmet according to claim 1, wherein the adjustment means includes a releasable fastener (46, 78, 108) located outside and above the helmet body (10, 70).
3. A helmet according to claim 2, wherein the releasable fastener is a two-part buckle (78).
4. A helmet according to claim 2, wherein the releasable fastener is a touch-and-close fastener (46, 108).
5. A helmet according to any of claims 1 to 4, wherein one end of the chin strap (28, 100) is connected to the other end thereof by the releasable fastener (78, 108).
6. A helmet according to any of claims 1 to 4, wherein a respective cheek strap (40, 50; 86, 88; 110, 112) is secured to the chin strap (28, 76, 100) so as to extend in use rearwardly across each of the wearer's cheeks to a respective slot (44, 54; 76, 78) in a rear part of the helmet body (10, 70).
7. A helmet according to claim 6, wherein each end of the chin strap (28) is connected to the free end of a respective cheek strap (40, 50), by a respective releasable fastener (46).
8. A helmet according to claim 6, wherein the free ends of the two cheek straps (86, 88; 110, 112) are joined to one another by a second releasable fastener (96).

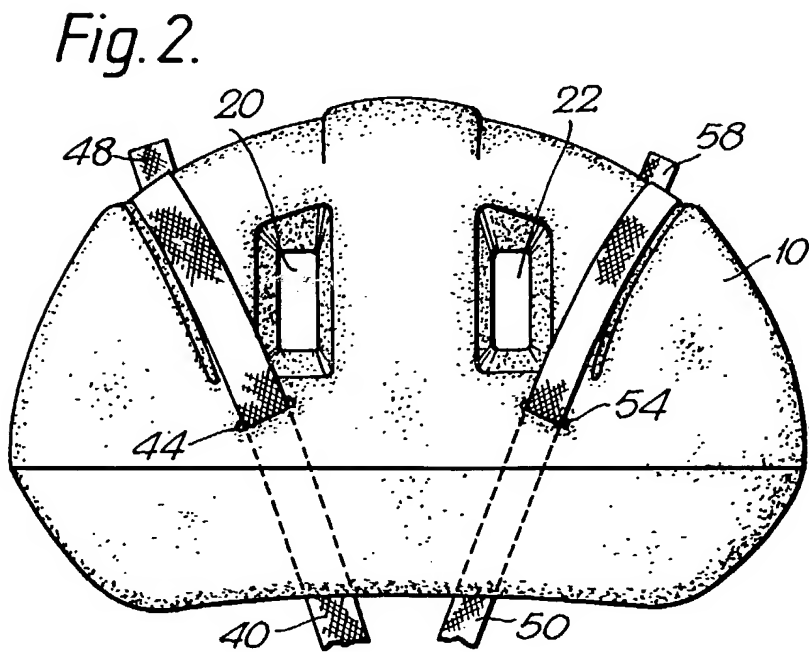
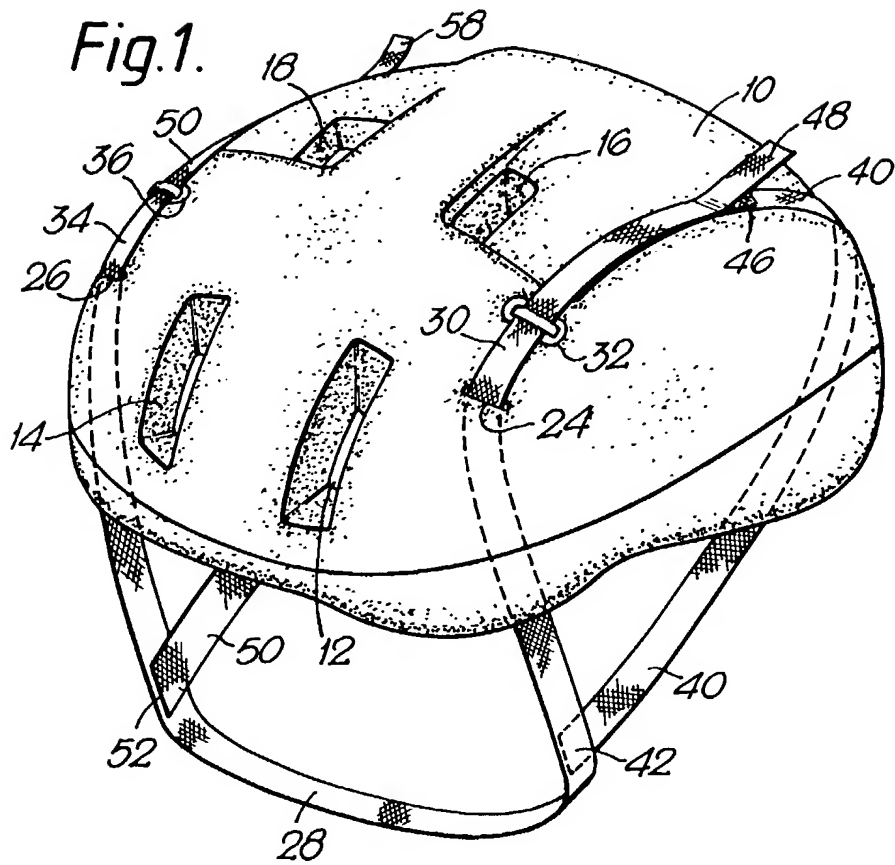


Fig. 3.

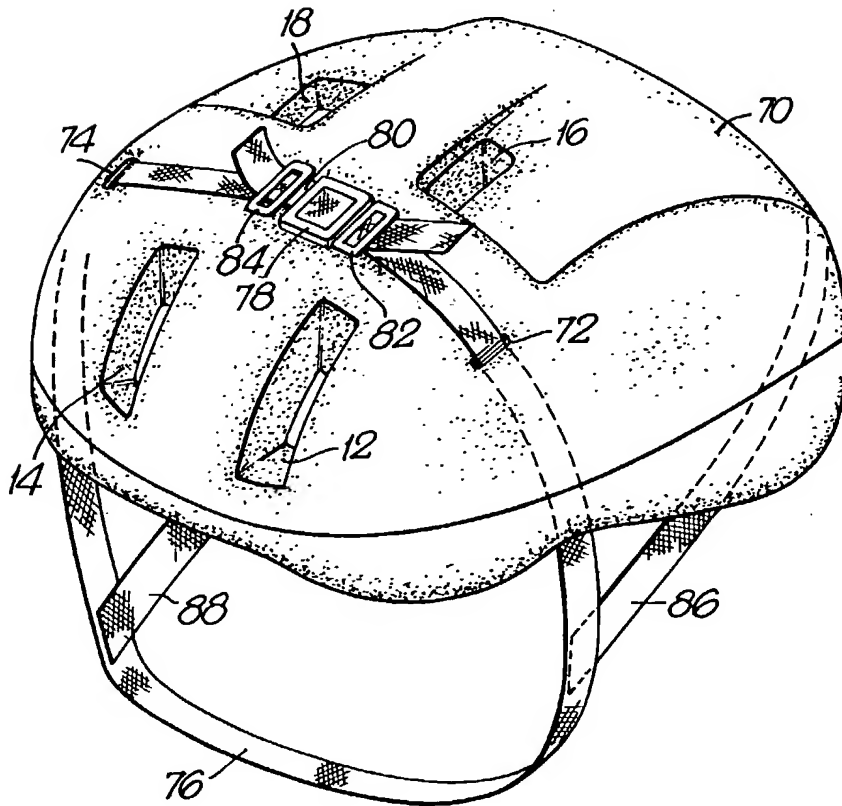


Fig. 4.

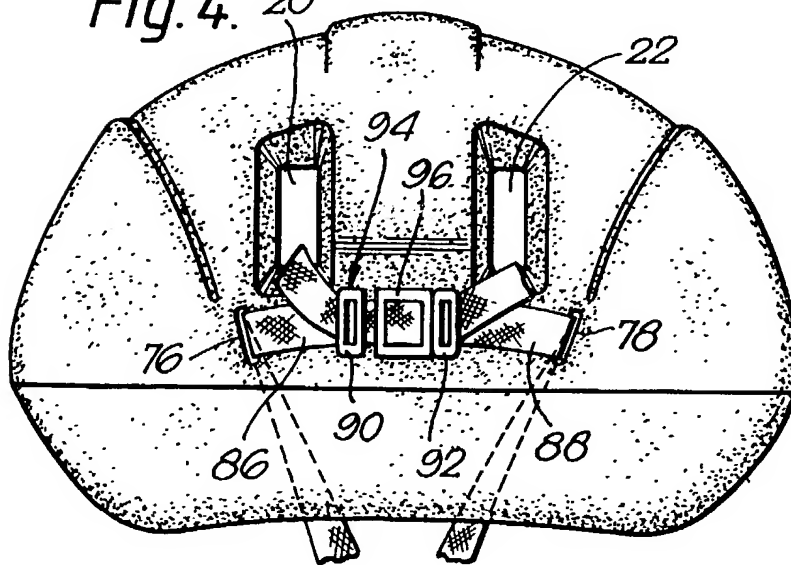
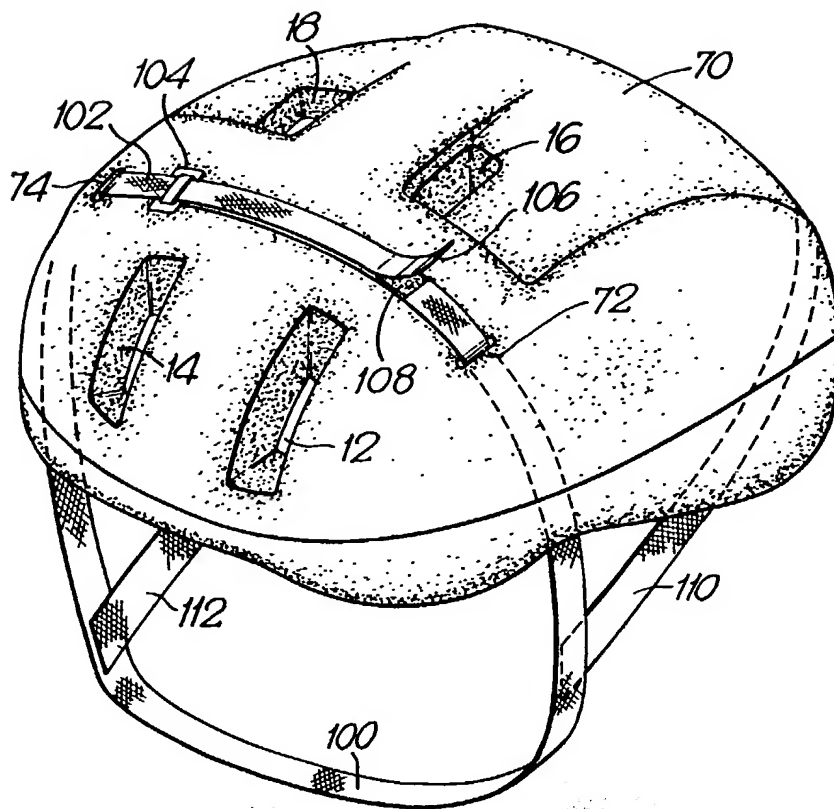


Fig. 5.





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## EUROPEAN SEARCH REPORT

Application Number  
EP 93 30 5324

| DOCUMENTS CONSIDERED TO BE RELEVANT  |  |  |   |
|--|--|--|---|
| Category   | Citation of document with indication, where appropriate, of relevant passages  | Relevant to claim                                    | CLASSIFICATION OF THE APPLICATION (Int. CL.5) |
| A  | EP-A-0 391 389 (K. W. HOCHSCHORNER GMBH)<br>* column 2, line 50 - column 3, line 8 *<br>* column 5, lines 19 - 40, 43 - 53 *<br>* column 5, line 57 - column 6, line 10 *<br>* figures 1-5 * | 1,2,4  | A42B3/08                                      |
| A  | EP-A-0 194 324 (W. SCHEFFCZYK)<br>* page 6, line 13 - page 7, line 9 *<br>* figures 1-3 *  | 1,2  |   |
| A  | DE-U-90 01 607 (K. W. HOCHSCHORNER GMBH)   |  |   |
| A  | GB-A-2 213 364 (DRÄGERWERK AKTIENGESELLSCHAFT)   |  |   |
| A  | US-A-4 901 373 (L. V. BROERSMA)  |  |   |
| D,A  | US-A-4 903 348 (L. V. BROERSMA)  |  |   |
| A  | US-A-5 005 220 (D. GAIATTO ET AL.)   |  |   |
|  |  |  | TECHNICAL FIELDS SEARCHED (Int. CL.5)         |
|  |  |  | A42B  |
| The present search report has been drawn up for all claims   |  |  |   |
| Place of search<br>THE HAGUE   |  | Date of completion of the search<br>11 November 1993 | Examiner<br>BOURSEAU, A                       |
| CATEGORY OF CITED DOCUMENTS  |  |  |   |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document  |  |  |   |
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